REMARKS/ARGUMENTS

Favorable reconsideration of this application in light of the following discussion is respectfully requested.

Claims 1-23 are presently pending in this case. Claims 1, 5, 9-11, 14-21, and 23 are amended by the present amendment. As amended Claims 1, 5, 9-11, 14-21, and 23 are supported by the original disclosure,[1] no new matter is added.

In the outstanding Official Action, Claims 16 and 17 were rejected under 35 U.S.C. §101; Claims 1-4, 8, 16, and 20 were rejected under 35 U.S.C. §103(a) as unpatentable over Schmid et al. ("Local Greyvalue Invariants for Image Retrieval," hereinafter "Schmid") in view of Roehrig et al. (U.S. Patent No. 5,815,591, hereinafter "Roehrig") and further in view of Hull (U.S. Patent No. 5,832,110); Claims 11-13, 21, and 22 were rejected under 35 U.S.C. §103(a) as unpatentable over Schmid and Roehrig and further in view of Lowe ("Object Recognition from Local Scale-Invariant Features," hereinafter "Lowe") and Matsuzaki et al. (U.S. Patent No. 6,804,683, hereinafter "Matsuzaki"); Claim 17 was rejected under 35 U.S.C. §103(a) as unpatentable over Schmid and Roehrig in view of Lowe; Claim 18 was rejected under 35 U.S.C. §103(a) as unpatentable over Watanabe et al. (U.S. Patent No. 7,084,900, hereinafter "Watanabe") in view of Schmid and Roehrig and further in view of Hull; and Claim 19 was rejected under 35 U.S.C. §103(a) as unpatentable over Watanabe in view of Schmid and Roehrig and further in view of Lowe. However, Claims 5, 6, 7, 9, 10, 14, 15, and 23 were indicated as including allowable subject matter.

Applicant acknowledges with appreciation the indication that Claims 5, 6, 7, 9, 10, 14, 15, and 23 include allowable subject matter. Claims 5, 9, 10, 14, 15, and 23 are amended herewith to be in independent form. Accordingly, Claims 5, 6, 7, 9, 10, 14, 15, and 23 are in condition for allowance.

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[1] See, e.g., the specification at page 21, lines 9-17.

Applicants and Applicants' representatives thank Examiners Kassa and Park for the courtesy of the interview granted to Applicants' representatives on April 21, 2009. During the interview, differences between the claims and the cited references were discussed. Examiner Park agreed that a proposed amendment to the independent claims appeared to overcome the rejections of record. This proposed amendment is presented herewith.

With regard to the rejection of Claims 16 and 17 under 35 U.S.C. §101, Claims 16 and 17 are amended to tie these claims to a particular apparatus, namely "at least one processor." Accordingly, Claims 16 and 17 are in compliance with the machine or transformation test enunciated in *In re Bilski*, and thus with all requirements under 35 U.S.C. §101.

With regard to the rejection of Claims 1, 16, and 20 as unpatentable over <u>Schmid</u> in view of <u>Roehrig</u> and further in view of <u>Hull</u>, that rejection is respectfully traversed.

Amended Claim 1 recites in part:

> wherein the feature quantity comparison means itinerantly shifts one of the density gradient direction histograms of feature points to be compared in density gradient direction to find distances between the density gradient direction histograms by sequentially shifting all of the feature points in the one of the density gradient direction histograms one by one to generate a plurality of shifted histograms, and generates the candidate-associated feature point pair by determining a shortest distance between (1) an other of the density gradient direction histograms and (2) the one of the density gradient direction histograms and the shifted histograms.

The outstanding Office Action conceded that <u>Schmid</u> and <u>Roehrig</u> do not describe this feature, and cited <u>Hull</u> as describing in this feature.[2] However, <u>Hull</u> only describes rotating histograms, which involves shifting data between columns proportional to the amount of rotation. In contrast, in the invention recited in Claim 1, the density gradient detection histogram is ***itinerantly shifted*** by sequentially shifting all of the feature points in the density

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[2]See the outstanding Office Action at pages 4-7.

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gradient direction histogram one by one to generate a plurality of shifted histograms. Thus, the feature point data is not partially shifted to other columns; the columns are rearranged by shifting them one by one for each of the shifted histograms.

Thus, it is respectfully submitted that Hull does not teach "feature quantity comparison means" as defined in amended Claim 1. Therefore, it is respectfully submitted that the proposed combination cannot teach or suggest this feature. Further, as Claims 16 and 20 recite similar subject matter, it is respectfully submitted the proposed combination does not teach or suggest the corresponding features of these claims either. Consequently, Claims 1, 16, and 20 (and Claims 2-4 and 8 dependent therefrom) are patentable over Schmid in view of Roehrig and further in view of Hull.

With regard to the rejection of Claims 11 and 21 as unpatentable over Schmid and Roehrig in view of Lowe and further in view of Matsuzaki, that rejection is respectfully traversed.

Claim 11 recites in part "feature quantity comparison means for comparing the feature quantity of each feature point of the object image with the feature quantity of each feature point of the model image and generating a candidate-associated feature point pair having similar feature quantities, *each candidate-associated feature point pair including one feature point of the object image and one feature point of the model image*."

The outstanding Office Action cited sections 4.2 and 4.2.1 of Schmid as describing "feature quantity comparison means" as recited in Claim 11.[3] However, Schmid compares a set of vectors representing *multiple extracted interest points* to a set of vectors representing query image I. The result of the comparison is a single, scalar value that is compared to a single, scalar threshold to determine if a vote should be cast. At no time is candidate-associated feature point pair including one feature point of the object image *and* one feature

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[3]See the outstanding Office Action at page 15.

point of the model image generated. Thus, it is respectfully submitted that <u>Schmid</u> does not teach "feature quantity comparison means" as defined in Claim 11. Further, it is respectfully submitted that <u>Roehrig</u>, <u>Lowe</u>, and <u>Matsuzaki</u> do not cure this deficiency of <u>Schmid</u>. Consequently, Claim 11 (and Claims 12 and 13 dependent therefrom) is patentable over <u>Schmid</u> and <u>Roehrig</u> in view of <u>Lowe</u> and further in view of <u>Matsuzaki</u>.

Claim 21 recites in part "a feature quantity comparison unit configured to compare the feature quantity of each feature point of the object image with the feature quantity of each feature point of the model image and to generate a candidate-associated feature point pair having similar feature quantities, *each candidate-associated feature point pair including one feature point of the object image and one feature point of the model image*."

The outstanding Office Action cited sections 4.2 and 4.2.1 of <u>Schmid</u> as describing "a feature quantity comparison unit" as recited in Claim 21.[4] As noted above, <u>Schmid</u> compares a set of vectors representing *multiple extracted interest points* to a set of vectors representing query image I. The result of the comparison is a single, scalar value that is compared to a single, scalar threshold to determine if a vote should be cast. At no time is a candidate-associated feature point pair including one feature point of the object image *and* one feature point of the model image generated. Thus, it is respectfully submitted that <u>Schmid</u> does not teach "a feature quantity comparison unit" as defined in Claim 21. Further, it is respectfully submitted that <u>Roehrig</u>, <u>Lowe</u>, and <u>Matsuzaki</u> do not cure this deficiency of <u>Schmid</u>. Consequently, Claim 21 (and Claim 22 dependent therefrom) is also patentable over <u>Schmid</u> and <u>Roehrig</u> in view of <u>Lowe</u> and further in view of <u>Matsuzaki</u>.

With regard to the rejection of Claim 17 as unpatentable over <u>Schmid</u> and <u>Roehrig</u> in view of <u>Hull</u>, that rejection is respectfully traversed.

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[4]See the outstanding Office Action at pages 18-19.

Claim 17 recites in part "comparing the feature quantity of each feature point of the object image with the feature quantity of each feature point of the model image and generating a candidate-associated feature point pair having similar feature quantities, *each candidate-associated feature point pair including one feature point of the object image and one feature point of the model image*."

The outstanding Office Action cited sections 4.2 and 4.2.1 of Schmid as describing "comparing" as recited in Claim 17.[5] As noted above, Schmid compares a set of vectors representing *multiple extracted interest points* to a set of vectors representing query image I. The result of the comparison is a single, scalar value that is compared to a single, scalar threshold to determine if a vote should be cast. At no time is a candidate-associated feature point pair including one feature point of the object image *and* one feature point of the model image generated. Thus, it is respectfully submitted that Schmid does not teach "comparing" as defined in Claim 17. Further, it is respectfully submitted that Lowe and Roehrig do not cure this deficiency of Schmid. Consequently, Claim 17 is patentable over Schmid and Roehrig in view of Lowe.

With regard to the rejection of Claim 18 as unpatentable over Watanabe in view of Schmid and Roehrig, and further in view of Hull that rejection is respectfully traversed.

Claim 18 recites in part "the feature quantity comparison means itinerantly shifts one of the density gradient direction histograms of feature points to be compared in density gradient direction to find distances between the density gradient direction histograms *by sequentially shifting all of the feature points in the one of the density gradient direction histograms one by one to generate a plurality of shifted histograms*, and generates the candidate-associated feature point pair by determining a shortest distance between (1) an

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[5]See the outstanding Office Action at page 22.

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other of the density gradient direction histograms and (2) the one of the density gradient direction histograms and the shifted histograms."

As noted above with respect to Claim 1, Hull only describes rotating histograms, which involves shifting data between columns proportional to the amount of rotation. Accordingly, the proposed combination does not include a device that itinerantly shifts density gradient direction histograms by sequentially shifting all of the feature points in the one of the density gradient direction histograms one by one to generate a plurality of shifted histograms as does the claimed invention. Thus, it is respectfully submitted that the proposed combination does not teach "feature quantity comparison means" as defined in Claim 18. Consequently, Claim 18 is patentable over Watanabe in view of Schmid and Roehrig and further in view of Hull.

With regard to the rejection of Claim 19 as unpatentable over Watanabe in view of Schmid and Roehrig and further in view of Lowe, that rejection is respectfully traversed.

Claim 19 recites in part "feature quantity comparison means for comparing the feature quantity of each feature point of the input image with the feature quantity of each feature point of the model image and generating a candidate-associated feature point pair having similar feature quantities, *each candidate-associated feature point pair including one feature point of the object image and one feature point of the model image.*"

The outstanding Office Action cited sections 4.2.1 and 4.2.2 of Schmid as describing "feature quantity comparison means" as recited in Claim 19.[6] As noted above, Schmid compares a set of vectors representing *multiple extracted interest points* to a set of vectors representing query image I. The result of the comparison is a single, scalar value that is compared to a single, scalar threshold to determine if a vote should be cast. At no time is a candidate-associated feature point pair including one feature point of the object image *and*
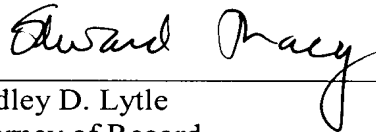
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[6]See the outstanding Office Action at page 30.

one feature point of the model image generated. Thus, it is respectfully submitted that

Schmid does not teach "feature quantity comparison means" as defined in Claim 19. Further,

it is respectfully submitted that Watanabe, Lowe, and Roehrig do not cure this deficiency of

Schmid. Consequently, Claim 19 is patentable over Watanabe in view of Schmid and

Roehrig and further in view of Lowe.

Accordingly, the pending claims are believed to be in condition for formal allowance.

An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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